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time in some more remunerative occupation, and thus add to the family income more than the extra cost of ready-cooked foods subtracts? These are questions that the future alone can answer. Meantime, it cannot be denied that there is today a tendency to have more and more work done outside the home, although it is a disputed question as to how far this tendency will be carried. One caterer reports that his sale of ready-cooked foods is five times greater than two years ago, and everywhere the sale of these foods has been so rapidly growing that a still greater increase may reasonably be expected in the near future. With an increased demand will come, in all probability, a decrease in price, an improvement in quality, and in means for delivering the food hot and ready to serve.

The work of the Committee on Domestic Service, whatever else may have been its result, is of great value, since it begins the investigation on a scientific basis of existing conditions in house-management. Although the inquiry has been limited, it has shown that the average housekeeper, practical and experienced though she may be, can give no accurate estimate of fuel, labor, living expenses of the employé, wear and tear of equipment, etc., and until these items and the numerous other family expenditures are definitely recognized and determined, the economic and scientific management of the household cannot be hoped for.

AVA M. STODDARD.

A STUDY OF MUNICIPAL GROWTH.

The Population and Finances of Boston. A Study of Municipal Growth. By Frederic H. Fay, M.S., Boston, 1901. 8vo. 33 pp., with 3 charts.

In this volume the author has attempted, by a careful survey of the past, to forecast the future growth of Boston in population, and to estimate the future increase in the valuation, income, expenditure and net debt of the city. It is assumed that, unless conditions radically change, the future growth along all these lines will continue about the same as in the past. The laws of growth, according to which the population has increased and the finances have developed, have been determined by an application of the method of least

squares to the data available in the past experience of Boston. By this method formulæ have been derived having the general form

$$X = A + Bt + Ct^2$$

in which X is the quantity sought, t is the time in years from 1900 (being negative prior, and positive, subsequent to that year) and A , B and C are constants derived mathematically from the observed data. Generally speaking, the growth of the population has been continuous from census to census from 1790 to 1900, and the finance statistics, too, have mounted upward, in such manner that, if plotted, the lines graphically representing the increase show an upward sweep.

Mr. Fay has shown care and discrimination in the use of his data. He has found the equation of the curves most closely fitting his various series of facts, and it is not unreasonable to suppose that the curves as extended to represent the predicted future growth will approach as closely the data actually recorded, in the near future, at least, as any that can be drawn on the basis of past experience.

To most statisticians the method of least squares must always form an almost insuperable obstacle. It is employed by astronomers and civil and mechanical engineers, but for the most part to correct several observations of the same fact when those observations show discrepancies. It is also used to a limited extent in such problems as the author here has before him. Other simpler methods may, however, be employed which are quite as satisfactory. The whole subject of the application of the theory of probability to statistics is admirably discussed in Part II of Bowley's *Elements of Statistics*. In the preface to his book (p. vii), writing of the method of least squares, Mr. Bowley remarks that "the phrase, useful in some connections, seems to make the application of the Law of Error to statistics unnecessarily complex."

This criticism, if so it may be called, does not in the least detract from the excellent work presented by Mr. Fay in his study of the municipal growth of Boston. The problems assigned him have been worked out in such manner and the solutions presented in such form that if the predictions prove to be wide of the mark it will not be

the fault of the prophet. The complexity of the determining conditions in such data as are here discussed make distant forecasts of even approximate accuracy well-nigh impossible.

F. S. CRUM.

EARLY CONGRESSIONAL DOCUMENTS.

Public Documents of the First Fourteen Congresses, 1789-1817. Papers relating to early Congressional Documents, prepared by A. W. Greely. Washington, 1900. 903 pp. (56th Congress, 1st session. Senate Doc. 428.) 8vo.

A pamphlet by General Greely, which appeared in 1897 on the same subject, was mentioned in the *Publications* in June, 1900 (vol. VII, page 57). The present greatly enlarged volume consists of four distinct parts: 1st, pp. 3-17, an introductory and historical essay; 2d, pp. 19-855, the main body of the volume, a List of the Journals, Reports and other documents of the first fourteen Congresses, with notes showing the character of the documents and the libraries in which the original editions may be found; 3d, pp. 856-858, a list of the most important publications containing reprints, in whole or in part, of the Proceedings, Journals, Documents, etc., of the early congresses, also of indexes and other finding lists to the Congressional documents; 4th, pp. 859-903, an index of names.

General Greely has collected a great many more titles of early documents than have ever been before brought together, and his compilation will doubtless supersede the early pages of Poore's *Descriptive Catalogue*, until General Greely's work, in turn, is surpassed by an even more nearly perfect list, such as we hope will be provided in the promised new *Checklist* from the Government Documents Office.

The fourth part of General Greely's book, the Index of names, is an especially valuable addition to our list of aids in the use of Government publications of early date.

L. P. L.